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WORKSHOP 2
Wednesday 14 october
h. 14.00-16.00
Brown Room 2

Evidence-based approach for continuous improvement of occupational health

L'approccio *evidence-based* per il continuo miglioramento della salute in ambito lavorativo

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Abstract

Introduction. It was recognized early on that an Evidence-Based Medicine (EBM) approach could be applied to Public Health (PH), including the area of Occupational Health (OH). The aim of Evidence-Based Occupational Health (EBOH) is to ensure safety, health, and well-being in the workplace. Currently, high-quality research is necessary in order to provide arguments and scientific evidence upon which effective, efficient, and sustainable preventive measures and policies are to be developed in the workplace in Western countries. Occupational physicians need to integrate available scientific evidence and existing recommendations with a framework of national employment laws and regulations.

Objective. This paper addresses the state of the art of scientific evidence available in the field (i.e., efficacy of interventions, usefulness of education and training of workers, and need of a multidisciplinary strategy integrated within the national PH programs) and the main critical issues for their implementation.

Conclusions. Promoting good health is a fundamental part of the smart, inclusive growth objectives of Europe 2020 - Europe's growth strategy: keeping people healthy and active for longer has a positive impact on productivity and competitiveness. It appears clear that health quality and safety in the workplace play a key role for smart, sustainable, and inclusive growth in Western countries.

(*Epidemiol Prev* 2015; 39(4) Suppl 1: 81-85)

Key words: evidence-based medicine, occupational health, health, workplace

Riassunto

Introduzione. Il contributo rilevante dell'approccio *evidence-based medicine* (EBM) applicato alla sanità pubblica è risultato da subito evidente, anche nell'area della tutela della salute in ambito lavorativo (*evidence based occupational health* - EBOH), il cui scopo è garantire sicurezza, salute e benessere nei luoghi di lavoro. Nei Paesi occidentali è necessaria una ricerca di elevata qualità ai fini di supportare scientificamente la scelta di misure e politiche di prevenzione efficaci, efficienti e sostenibili in ambito occupazionale. Il medico competente deve integrare nelle proprie attività le evidenze scientifiche e le raccomandazioni esistenti, nel rispetto di specifiche norme e riferimenti legislativi.

Obiettivo. Questo articolo descrive lo stato dell'arte delle evidenze scientifiche disponibili in materia (es: efficacia degli interventi, utilità dell'informazione e formazione dei lavoratori, necessità di strategie multidisciplinari integrate nei programmi nazionali di salute pubblica) nonché le principali criticità della loro applicazione.

Conclusioni. La promozione della salute costituisce uno dei principali obiettivi della strategia di crescita del progetto «Europa 2020» della Comunità europea: mantenere la popolazione attiva e in salute quanto più a lungo possibile ha indubbiamente un impatto positivo su produttività e competitività. Pertanto, risulta evidente come la qualità della salute e la sicurezza nei luoghi di lavoro siano fondamentali nel promuovere lo sviluppo razionale, sostenibile e solidale dei Paesi occidentali.

(*Epidemiol Prev* 2015; 39(4) Suppl 1: 81-85)

Parole chiave: *evidence-based medicine*, *occupational health*, salute, luoghi di lavoro

INTRODUCTION

Evidence-Based Medicine (universally known as EBM) has become an umbrella term which does not only include the retrieval and translation into practice of high-quality evidence, but also involves production of the evidence, and evaluation of the real-life effect of applied changes.

It was recognized early on that the EBM approach could be applied to Public Health (PH) issues, including the area of Occupational Health (OH). High-quality research can provide evidence upon which effective, efficient, and sustainable policies and prevention measures can be developed, in order to provide helpful tools for the occupational physician at the corporate level:[1] the goal is to ensure safety, health, and wellbeing in the workplace.

OH shares with other areas of healthcare the need to define good practices and check their effectiveness, as well as relying on a framework of employment law, practices, and regulations. A number of differences from other areas of PH can be found in the jeopardized competencies and wide responsibilities following separate organizations involved in its management, and because health maintenance is usually considered an incidental part of business activities, and not the central purpose of the enterprise. While medicine is typically based on the dyadic physician-patient relationship, OH is based on a triadic relationship between employer, physician, and employee.[2] Thus, while the principles of evidence-based practice will be similar to those of medicine, there are likely different reasons for applying them and different responses to the use of evidence-based information in this specific field.

In the context of OH, whereas the evidence on the association between a number of potential exposures (i.e., chemical, physical, biological, and behavioural or environmental) at the workplace and the onset of some occupational diseases is still scarce or non-existent, still, both occupational physicians and court technical advisers are repeatedly required to perform a complex job retrieving and interpreting the available evidence on disparate questions. The issue is critical, as intuitively confirmed by referring to Brownson's classical questions:

1. Is the exposure that we are considering defined as a risk factor for human health?
2. What are the effective interventions needed to deal with this risk factor?
3. Under the economic, social, and environmental viewpoints in which we are to act, which of the effective interventions is the most suitable?[3]

The first and third questions are related to appropriateness, while the second to the effectiveness of the preventive interventions. Moreover, it is well known that not every «appropriate» intervention is also «effective» in reducing occupational risk in real life.

STATE OF THE ART OF SCIENTIFIC EVIDENCE AVAILABLE IN THE FIELD OF OCCUPATIONAL HEALTH

An overview of evidence-based methodology applied to essential interventions to prevent occupational diseases and injuries, focusing on different aspects, both from the viewpoint of occupational hygiene and occupational medicine, has been recently reported by Verbeek et al.[4] Table 1 summarizes the results from 24 systematic reviews in the literature.[5-28]

With specific regard to back pain, several Authors investigated its prevention introducing the use of mechanical devices, by either nursing staff or lift teams, to reduce workload in patient lifting:[29] even though results repeatedly demonstrated that most staff back injuries were preventable among nurses, leading to substantial savings to employers on medical and compensation costs, a longitudinal study performed in Italy found no effect in the reduction of both low back pain, investigated using an ad hoc symptom questionnaire, and mean length of absenteeism for associated disease.[30] Given this scenario, it is clear that further high-quality research is needed, with original studies and systematic reviews focusing on safety and health prevention.

A Cochrane review by Mahmud et al.[31] showed that pre-employment examination and preventive medical controls can be effective in reducing occupational diseases, injuries, or sickness absence, concerning specific occupational hazards, especially in workers potentially at risk, particularly after the implementation of regulations or limitations, and after specific training activities.

Another issue is that risky behaviour is an extremely significant cause of the large number of occupational injuries, diseases and deaths in the workplace:[32] in light of this, adequate information and training of workers about health and occupational safety has been a common approach worldwide for many years. Training should educate professionals to recognize hazards, adopt safe working practices, and improve work-environment and organization, through active, continuous interaction with employers.[24]

With respect to the effectiveness of training activities to improve health and occupational safety, a recent systematic review[33] demonstrated that strong evidence exists for the effectiveness of training on worker behaviours concerning health and occupational safety, but insufficient evidence was found of its effectiveness on health outcomes (i.e., symptoms, injuries, illnesses): Authors recommended that workplaces continue to deliver training to employees because training positively affects worker practices; however, it was not easy to observe any large impact of this activity on health based on the available research evidence.

Training the PH workforce to practice EBOH (Evidence-Based Occupational Health) can contribute to effectively influence health outcomes in workplaces:[34] a qualitative research, exploring the perceptions of occupational physicians regarding evidence-based practices, showed that professionals favourably evaluated the intervention, and job satisfaction, autonomy, and self-confidence rose; studies, however, are often time-consuming, and this was identified as a major barrier.[35]

INTEGRATION OF EBOH WITHIN PH STRATEGIES

Today, efforts to integrate EBOH interventions within the context of the national PH strategies and programs need to

Work-related disorder to be prevented	Environmental interventions	Behavioural interventions	References
cancer **pneumoconiosis** **asthma** **chronic obstructive pulmonary disease (COPD)**	technical measures ■ substitution** ■ enclosure^ ■ local exhaust ventilation§ ■ special ventilation systems§ ■ general ventilation^ ■ dust suppression techniques§ ■ segregation of sources (no studies) ■ separation of the worker§ implementation measures ■ regulation^ ■ economic incentives**	respiratory protection ■ technical properties* ■ implementation*	Fransman W et al., 2008 LaMontagne AD et al., 2006 Cullinan P et al., 2003 Creely KS et al., 2007 Park D et al., 2009 Symanski E et al., 1998 Elsler D et al., 2010
noise-induced hearing loss	technical measures ■ hearing loss prevention program° implementation measures ■ regulation^ ■ incentives*	hearing protection ■ technical properties without instruction** with instruction§ ■ implementation school-based^ work-based**	Verbeek JH et al., 2009 El Dib RP et al., 2009
back pain	technical measures ■ ergonomics° ■ maximum weight lift* implementation measures*	aids ■ technical properties* ■ implementation° instruction manual material handling/lifting° incentives*	Rivilis I et al., 2008 Driessen MT et al., 2010 Verbeek J et al., 2011 Martimo KP et al., 2007 Clemes SA et al., 2010 Bigos SJ et al., 2009 Dawson AP et al., 2007
injury prevention	technical measures ■ fall prevention* ■ other measures* ■ rollover protection^ implementation measures ■ regulation** ■ experience rating§ ■ enforcement^ ■ inspections^ ■ penalties§ ■ subsidies*	safety equipment ■ technical measures* ■ implementation* education° / training** education agriculture° safety climate* worker incentives ■ monetary^ ■ praise and feedback^ ■ team competitions^	Rautiainen RH et al., 2008 Tompa E et al., 2007 van der Molen HF et al., 2007 Cohen A et al., 1998 Robson LS et al., 2010 Burke MJ et al., 2006 Hartling L et al., 2004 McAfee RB et al., 1989

*no evidence on systematic review.; if evidence available:** some indication of effectiveness;° no indication of effectiveness; ^ indication of effectiveness; § strong indication of effectiveness

Table 1. Evidence for effectiveness of studies included from PubMed (adapted from Verbeek J et al. *Saf Health Work* 2013[4]).
Tabella 1. Livello di evidenza di efficacia in studi pubblicati su PubMed (adattata da Verbeek J et al. *Saf Health Work* 2013[4]).

be improved, especially in developed countries, and should be oriented toward avoiding workers' illness, injury, and disability, and promoting health, function, and wellbeing. The critical issues identified in wellbeing include socioeconomic status, workplace factors, environmental factors, occupational hazards, personal health information, and demographic factors.[36]

Functions traditionally considered to fall under OH include activities such as compliance with regulations, training programs to learn more about safety, ergonomics, blood-borne pathogens, and radioprotection. The aim has been the improvement of individual behaviours to safeguard workers' health through group-based activities, although more recent efforts have focused on changes in organizational frameworks reducing risk exposures in the physical or psycho-social environment.[37]

A multi-disciplinary approach between different PH professionals, also following collaborative agreement between the main scientific societies, may prove more effective than separate efforts in order to protect and promote health among workers:[38] to meet this goal, both organizational and environ-

<table>
<tr><th>Results, impact and outcomes</th><th colspan="4"></th><th>Factors that drive program and process</th></tr>
<tr><td>Community health</td><td rowspan="6">Legal</td><td colspan="3">Workplace
Physical - Psychosocial - Organizational</td><td rowspan="6">Economic</td><td>Leadership</td></tr>
<tr><td>Organizational performance</td><td rowspan="5">Work-Family-Community Interface</td><td rowspan="5">WORKER HEALTH AND WELL-BEING</td><td rowspan="5">Worker
Health behaviour, health resource, care management</td><td>Strategic</td></tr>
<tr><td>Human performance</td><td>Integrated</td></tr>
<tr><td>Worker health</td><td>Coordinated</td></tr>
<tr><td>Family health</td><td>Systematic</td></tr>
<tr><td>Efficiency/Effectiveness</td><td>Incentivized</td></tr>
<tr><td>Synergy</td><td rowspan="6">Political</td><td rowspan="6">Social</td><td>Comprehensive</td></tr>
<tr><td>Engagement</td><td>Multi-level</td></tr>
<tr><td>Participation</td><td>Multi-component</td></tr>
<tr><td>Integration</td><td>Data-driven</td></tr>
<tr><td>Collaboration</td><td colspan="3" rowspan="2">Employment
Global economy - Health benefits</td><td>Prioritization</td></tr>
<tr><td>Communication</td><td>Decision-making</td></tr>
</table>

Table 2. Summary of the principal key words and strings on current knowledge in integrated worker health protection and promotion (IWHPP) programs (adapted from Pronk NP. *J Occup Environ Med* 2013[40]).
Tabella 2. Riassunto delle principali parole chiave e stringhe di ricerca di attuale conoscenza all'interno del programma integrato di protezione e promozione della salute dei lavoratori (adattata da Pronk NP. *J Occup Environ Med* 2013[40]).

mental levels, as well as individual and community levels, need to be properly addressed.
In this scenario, several frameworks and multidisciplinary programs have been described in the literature. For example, in the US, the proceedings of the National Institutes of Health and Centers for Disease Control and Prevention (NIH-CDC) chronic disease prevention workshop described an integrated model, the Integrated Worker Health Protection and Promotion (IWHPP) program, including intervention targets of work environment (physical, organizational, and psychological), individual health-related behaviours, and work-family-community interface, in the context of legal, social, political, and economic factors, facilitating collaboration, synergy, and integration. The framework considered the worksite as a primary setting for the protection and promotion of health among workers, but also for their families and the community at large.[39] It presented an integrated approach for the delivery and evaluation of programs organized around principles of business ethics, even taking into account legal and corporate factors (table 2).
Another experience is represented by the NIOSH Total Worker Health (TWH) as «a strategy integrating occupational safety and health protection with health promotion to prevent worker injury and illness and to advance health and well-being».[38] This program also explicitly recognizes that health and well-being of workers is an objective shared by workers, their families, and employers, conditioned by the work environment and extra-work activities.
A systematic review by the Task Force on Community Preventive Services in the US showed effectiveness for health risk assessment with feedback plus follow-up interventions.[40]
Thus, an integrated approach is supported by existing evidence in terms of health outcomes, but will benefit significantly from high-quality research designed to strengthen the business case for employers.
Similar concepts have recently been shared in an official document by the main Italian PH scientific societies (the Italian Society of Occupational Medicine and Industrial Hygiene – SIMLII, the Italian Society of Hygiene, Preventive Medicine and Public Health – SItI, and the Italian Association of Industrial Hygiene – AIDII) in order to improve safety, OH, and health promotion alongside with the quality of applied research both in the workplace and the community.[41]
Furthermore, integrating EBOH interventions within the context of global PH policies may benefit the larger organization through cost reductions or cost savings: there is a general consensus that positive economic outcomes in society cannot be generated without effective interventions.
Promoting good health is a fundamental part of the smart, inclusive European Commission objectives of «Europe 2020 – Europe's growth strategy». Keeping people healthy and active for longer has a positive impact on productivity and competitiveness:[42] health quality and safety at all workplaces have a key-role to play in delivering smart, sustainable, and inclusive growth in Western countries.

Conflicts of interest: none declared

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